YINGLI SOLAR
中国·英利

Yingli Energy Development Company Limited

Global Leading Solution-Provider
For Smart Photovoltaics

One of the **earliest** enterprises that participating the PV Industry in China.

Synchronize the process of technology research, intelligent manufacturing, power plant development, construction and operation.

The headquarters in Baoding, Hebei province of China with manufacturing factories in Tianjin, Hengshui, Yantai, Jiujiang, Wuzhong, etc.

24 years

24 Years focus on solar module manufacturing

50GW

Cumulative shipments more than 50GW

100+

Offer modules to more than 100 countries and regions

10+

More than 10 workshops and offices all over the world

2039

2039 Items National patent application

5

5 National R&D platform

01 History & experience

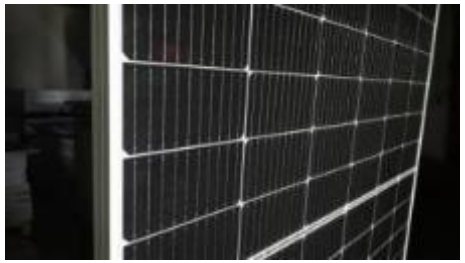
Top leader, bright Future

24 years photovoltaic industry development

1998-2006
Foundation

Yingli entered into the solar industry in 1998.

In 1999, Yingli undertook the first polysilicon production line in China with annual capacity of 3MW, which is the first line for solar in China.



2007-2009
Innovation

As the lead to innovate the N-type "PANDA" high efficiency solar cell.

Achieved Top 3 solar cell efficiency at that moment.

Listed in New York Stock Exchange on June 8th, 2007

2010-2014
Domination

The first Chinese and the first renewable energy company to sponsor the FIFA World Cup™ in 2010 and 2014.

Ranked consecutive two years of No.1 in terms of global shipments in 2012 and 2013.

2015-2021
Optimization

Optimized asset structure and capital cooperation.

Actively seeking high-quality development opportunities.

2022-now
Rebirth and Progressing

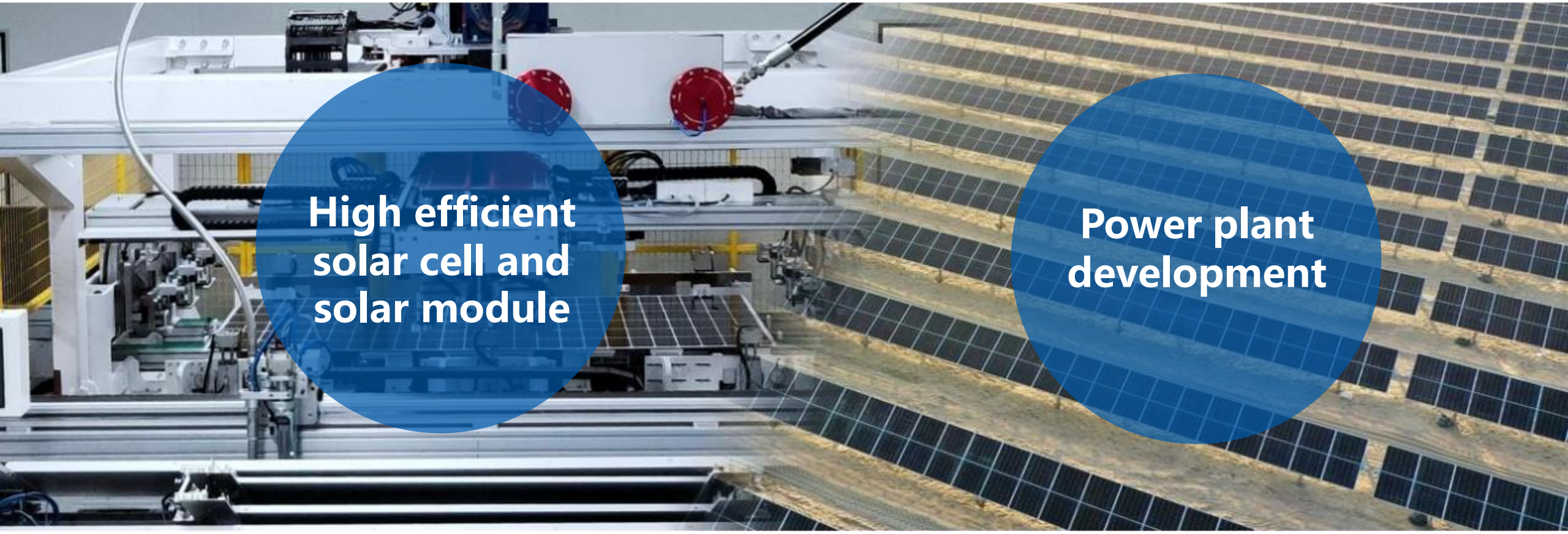
Re-listed of Tier 1 manufacturer by BNEF.
With full advantages of technology and the brand, Yingli has a bright future.

1998 2002 2006 2010 2014 2018 2022

02 Business scope

Intelligent manufacturing and power plant development

Focus on Intelligent manufacturing and power plant development



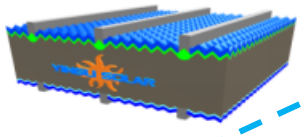
Yingli Three-Year Products Road Map (2022-2024)

Focus on N-type products

Cell efficiency (%)

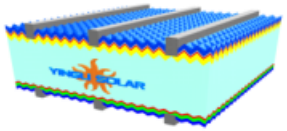
28
27
26
25
24
23

PERC+



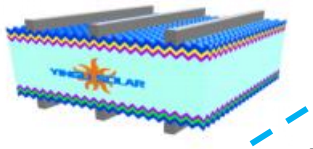
- Laser SE technology
- Stack-layer passivation technology

PANDA-Topcon



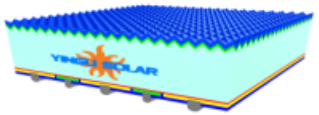
- Tunnel oxide passivated contact technology
- Stack-layer passivation technology
- Low recombination surface doping technology

PANDA-HJT



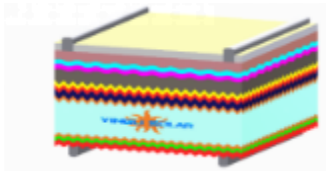
- High efficiency doped thin film silicon technology
- Novel conductive reflective layer material
- Low resistance fine metallisation process

PANDA-IBC



- Nano-scale light trapping technology
- Precise selective doping technology

Tandem

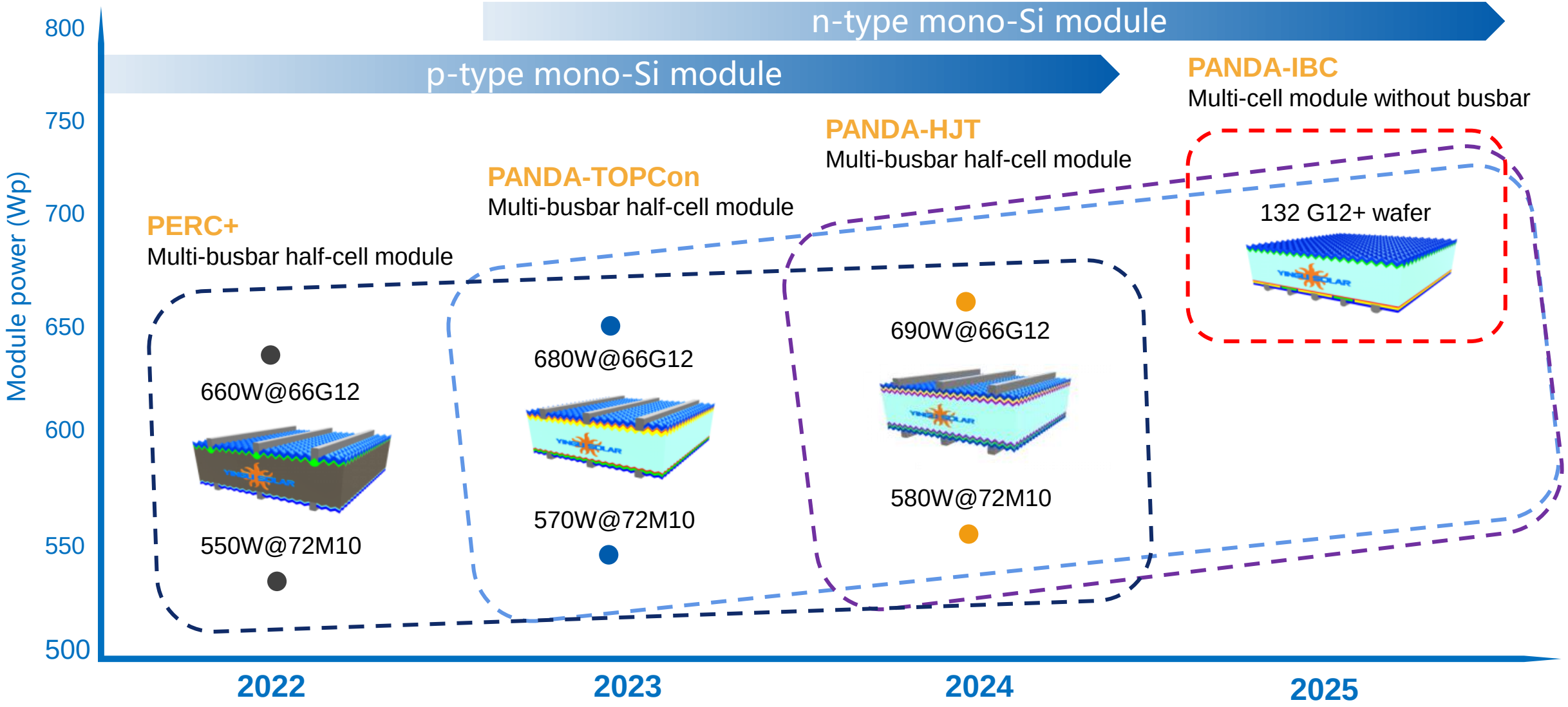


- Band gap matching technology
- Carrier transport tuning technology

2022 2023 2024 2025 2026

Yingli Three-Year Products Road Map (2022-2024)

Focus on N-type products



Yingli Three-Year Development Roadmap (2022-2024)

Building stable and matured market path, revitalize domestic and international market share

Promote strategic partnership and develop deep relationship.

Establish a wholistic service model:

Improve customer experience with comprehensive technical support and high-quality products and professional service.

Take advantage of overseas teams:

Integrate the original sales system and combine the flexible sales mechanism to provide localized services for customers.

Serving markets with technological advantages:

With the goal of reducing LCOE, supplying more suitable products and service to various markets.

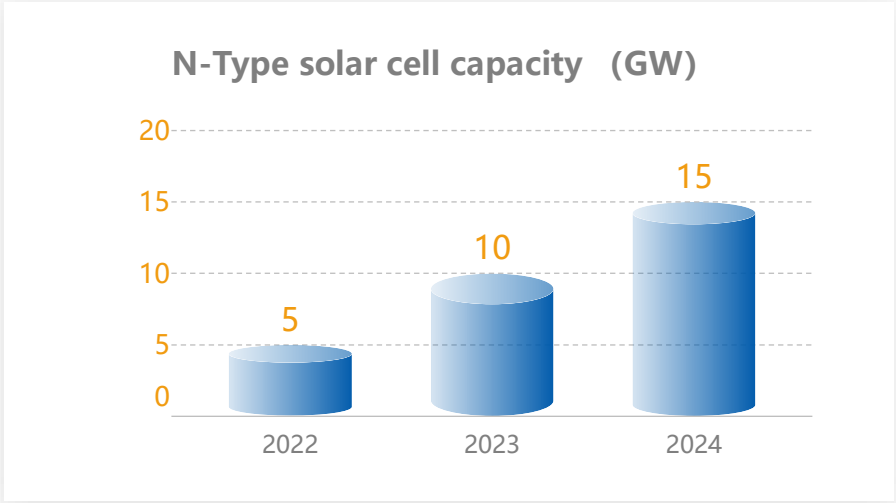
Yingli Three-Year Development Roadmap (2022-2024)

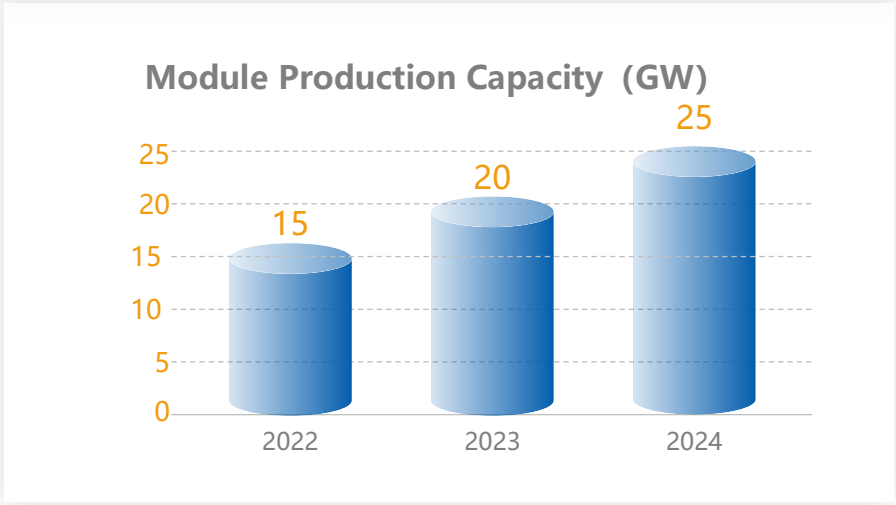
Construction of large solar plants in Domestic market

Over the next three years, Yingli will develope and constructe about 1.5GW solar plants per year and operate minimum 500MW solar plants.

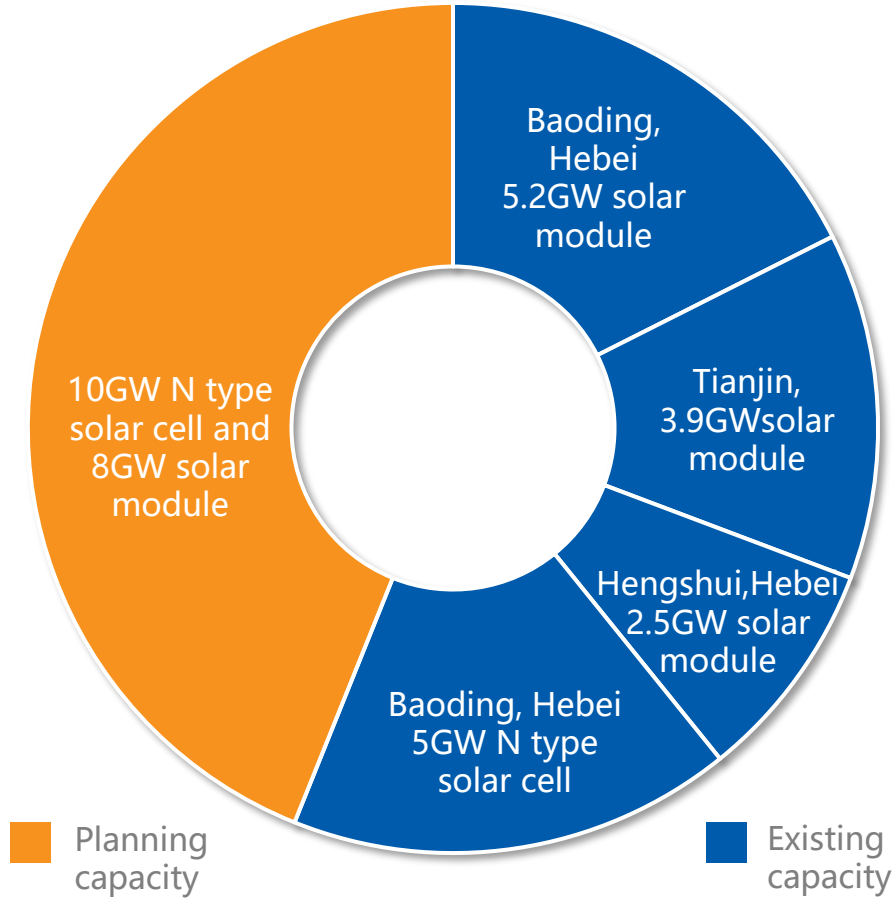
Yingli Three-Year Development Roadmap (2022-2024)

High-efficient product capacity





The total investment in fixed assets of **10 billion** RMB, focusing on n-type technology and products.



03 Advantage

Technological innovation

National PV R&D Platform

UL Non-witness certificate

CNAS certificate

CGC Eyewitness certificate

In addition to undertake the above-mentioned national R&D platforms , Yingli internal lab received the UL non-witness certificate , CNAS certificate and CGC certificate.

National PV R&D Platform

- The only **Technical Standard Innovation base** in the PV industry and in China.
- **More than 100 professional R&D engineers** with deep cultivation of PV technology for many years
- Compiled 118 PV industry standards

Openly and Deeply cooperate with multiple R&D institutions

- Carry out extensive technical cooperation and personnel training with Institute of Electrical Engineering, China Institute of Chinese Academy of Electronic Technology Standardization, North China Electric Power University, and other top R & D institutions and universities.
- Establish long-term and stable scientific research and cooperative relations with DuPont, Sinopec and other international enterprises.

YINGLI SOLAR

panda

N-type Panda Technology

One of the world's
high-efficiency cell technology

PANDA Module Technology Roadmap

	PANDA1.0 N type PERT	PANDA2.0 N type IIF	PANDA3.0 N-type TOPCon
Cell efficiency	20.5%	21.0%	24.5%
Module efficiency	17.3%	18.2%	21.8%
Bifacility	-	80.0%	85.0%
1st year degradation	2.0%	2.0%	1.0%
Linear degradation	0.6%	0.5%	0.4%
Front Power	**285W**	**300W**	**570W**

PANDA 3.0 high efficiency cell technology

Panda 3.0-TOPCon Technology

High Performance

TOPCon vs PERC	0 LID	Excellent Bifacility	Better Tem co-eff	Low Irradiance
TOPCon	0	85%	- 0.32%/℃	-1.9%
PERC	~1.2%	70%	- 0.35%/℃	- 3.3%

Quality Reliable

Anti-PID	Anti-Snail pattern	Strong mechanical	Weather resistivity

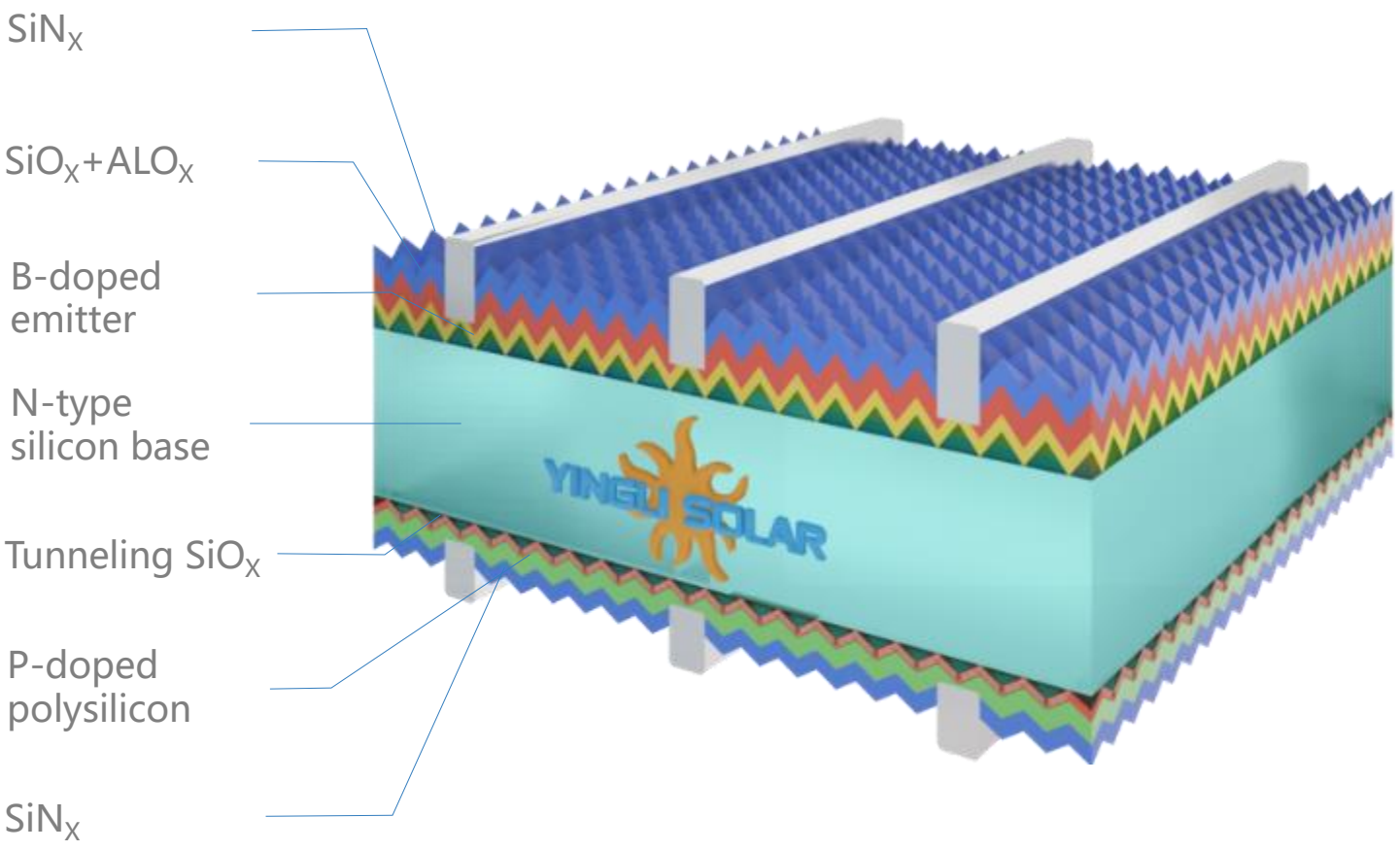
Super High Efficiency

TOPCon vs PERC	Low BOS	Low LCOE	12 years	30 years
TOPCon	1.17% ↓	1.37% ↓	-	20% ↑

*TOPCon vs PERC
Based on the actual data of Hebei Power Plant

PANDA 3.0 high efficiency cell technology

High efficient N-type TOPcon Technology



New surface passivation system

- Front laminated composite film passivation
- Rear tunneling passivation

Perfect optical performance

- Rear micro processing
- Ultra thin tunneling passivation

Efficient cleaning technology

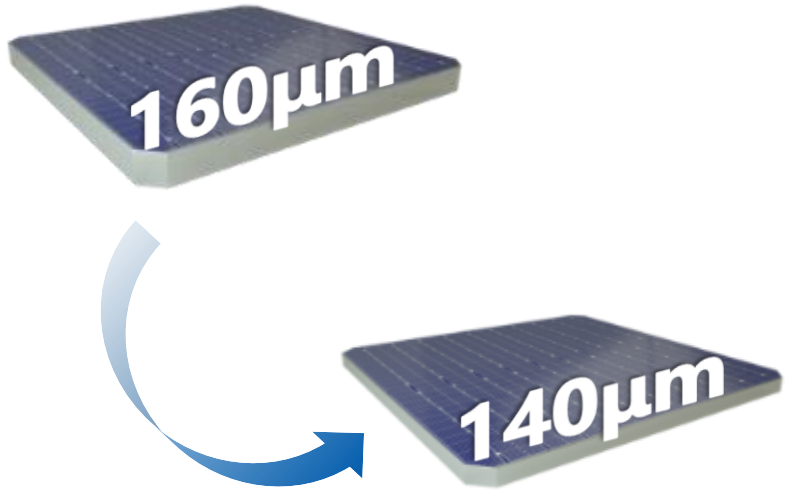
- Surface etching
- Efficient cleaning

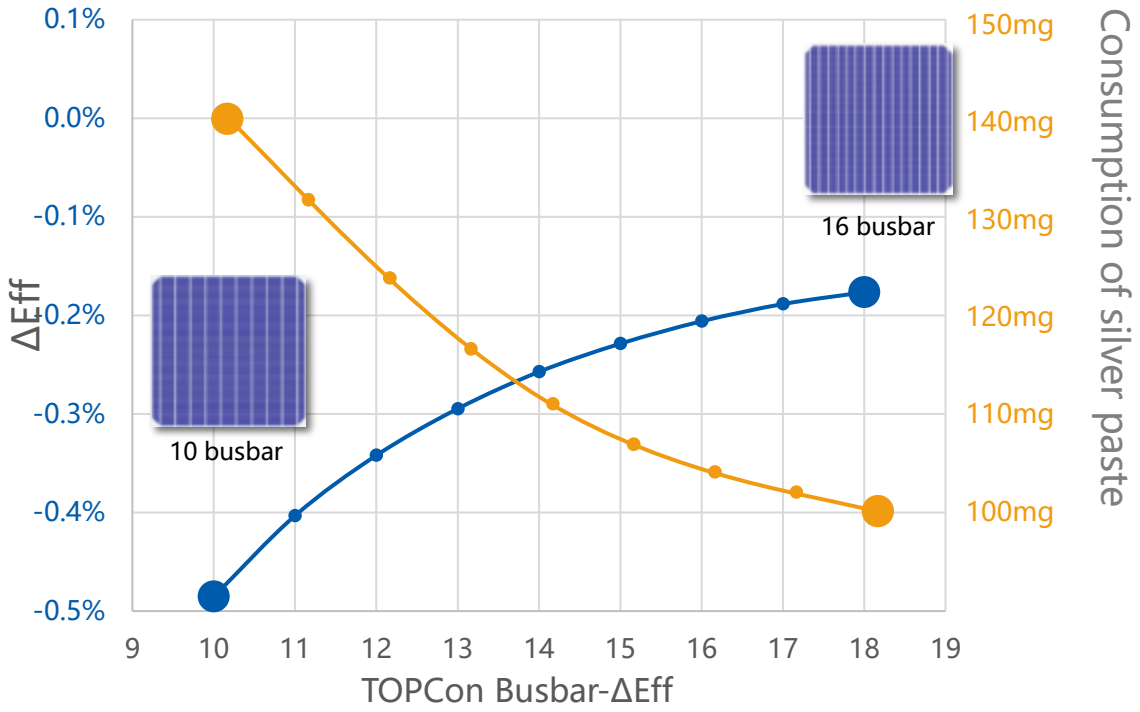
Excellent cell performance

- Cell efficiency > 24.5%
- Higher Bifacial power generation
- Excellent Anti-LID/PID performance

PANDA 3.0 high efficiency cell technology

Advanced manufacturing process





Thinner wafer process

- Wafer thickness reduced to 140μ m
- Advanced semi-flexible manufacturing process

Multi-busbar + Hyperfine printing

- Busbar width reduced to 20μm
- Greatly reduce silver paste 140mg→100mg

PANDA product Application Case

China
Datong Top Runner

50MW Panda project, ranked first always by actual power generation

Oman
IBRI 2 Bifacial Power Plant

400MW – the Largest bifacial power plant in the Middle East

Netherlands
Gelderland Power Plant

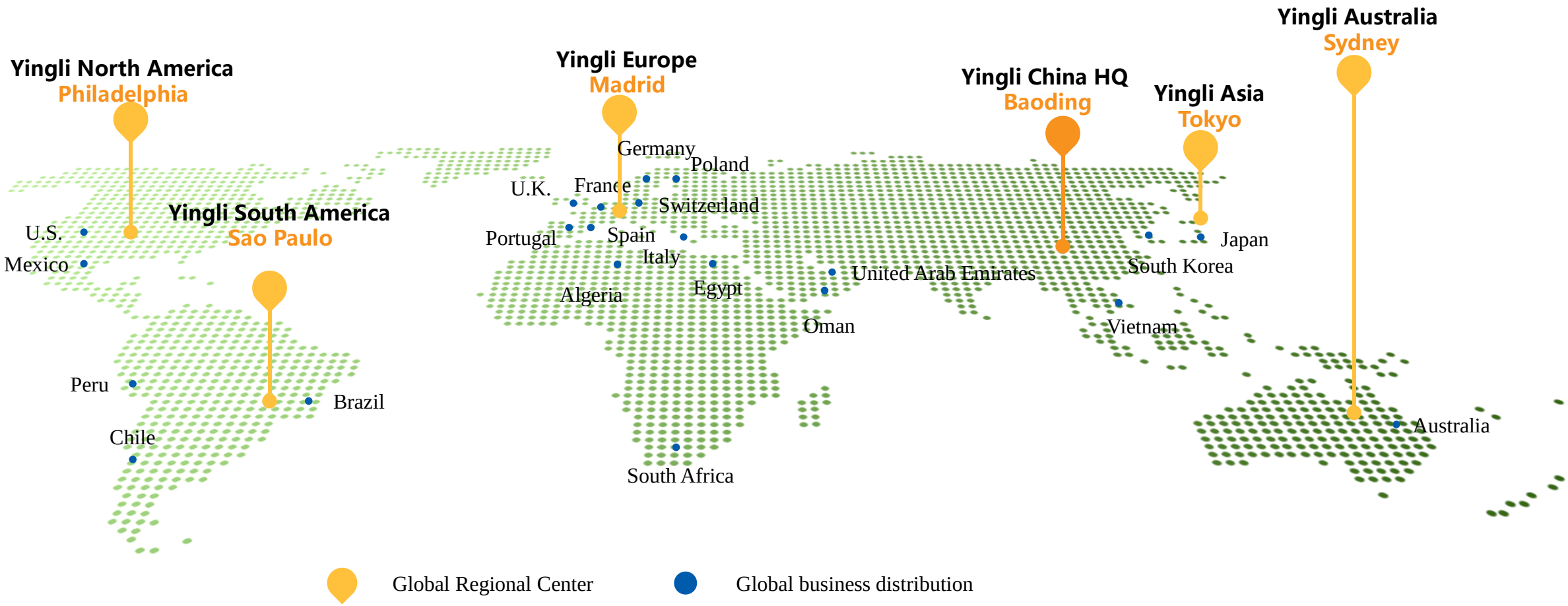
Demonstration project of bifacial modules in Europe.

China
Nansha Islands Project

Running well under high temperature, high wind load, high salty corrosion environment.

Global Sales and Service Network

Yingli has provided PV products to **132 countries and regions in total,** ranking **third** in the number of countries.



Global Strategic Partners

Enterprise Honor

BloombergNEF
Tier 1

Global Module Brands
No.1 in Popularity

RETC Best
Performance Award

PVEL
Top Performer

WWF
Carbon Reduction
Pioneer

Rheinstar Module
Power Generation
Award

National
Green Factory

Global Green Economy
Top 10 Leading
Enterprise Award

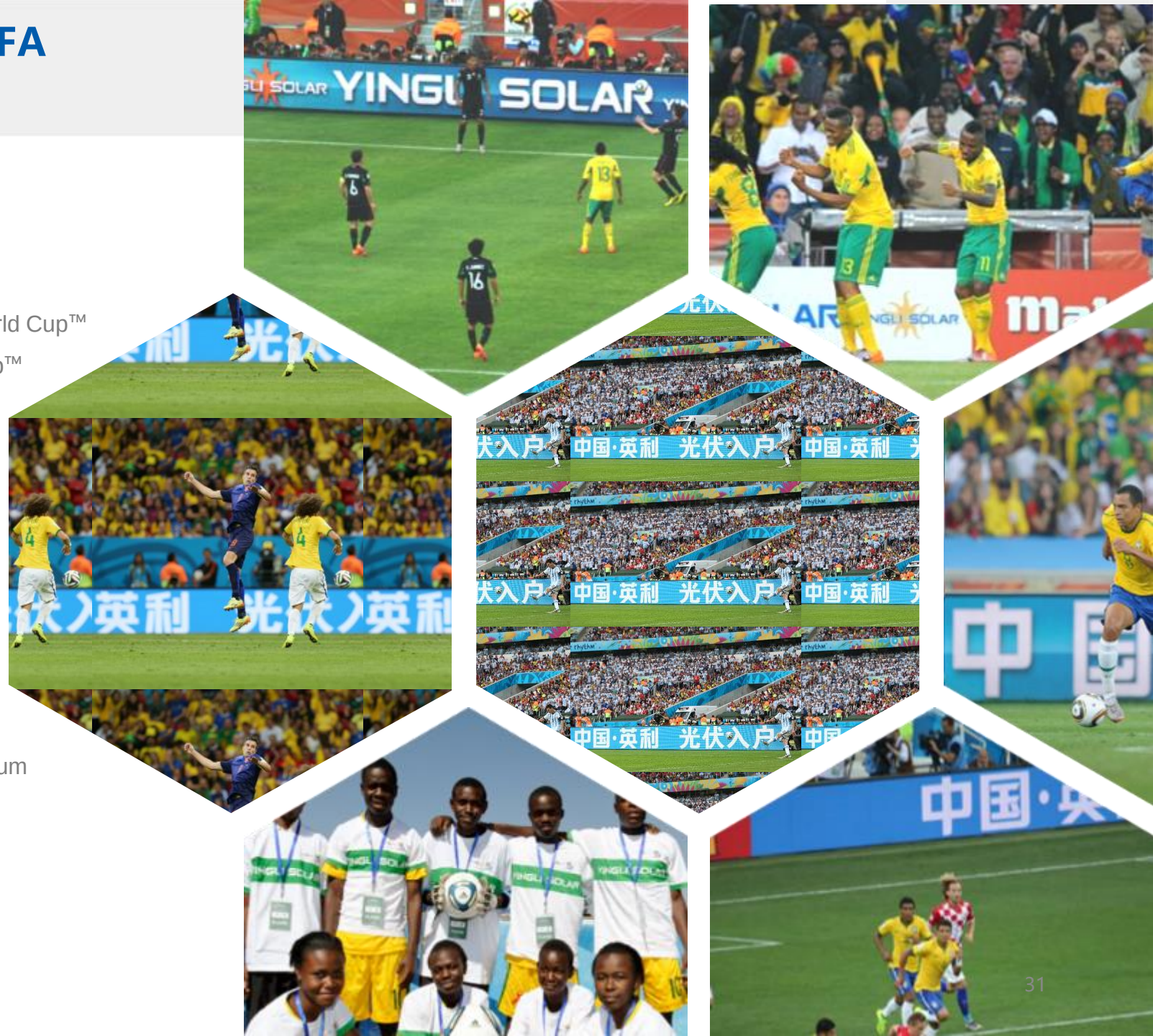
Official Sponsor of the FIFA World Cup™

2010 South Africa World Cup™

- The First Renewable energy company to sponsor FIFA World Cup™
- The First Chinese company to Sponsor the FIFA World Cup™
- The first company to bring PV to the World Cup

2014 Brazil World Cup™

- Provide 390KW solar module for Maracana stadium
- Provide 1.5MW solar module for Arena Pemambuco stadium
- Provide 27 sets lighting system for all match cities
- Support the 2014 World Cup in Brazil a "Green Event”



Social Responsibility

Solar power For Sanjiangyuan National Nature Reserve

Supporting Poverty Alleviation Progress in Taihang Mountains Area

Donate Solar lighting systems for 20 football stadiums in Africa

Donate 6.1 million RMB Solar Systems for Changjiangyuan Ecological Environment Protection Station

Donate 5 million RMB off grid Solar Systems for Sansha city

Donate 128 sets on-grid power systems for the villages of Zhangbei county

04 Project Introduction

Worldwide Footprint

Large Scale Project

233MW | Algeria

46MW | Portugal Mora

390KW | Rio de Janeiro

11.52 MW | Badajoz

Large Scale Project

50MW | Shanxi Top Runner Project

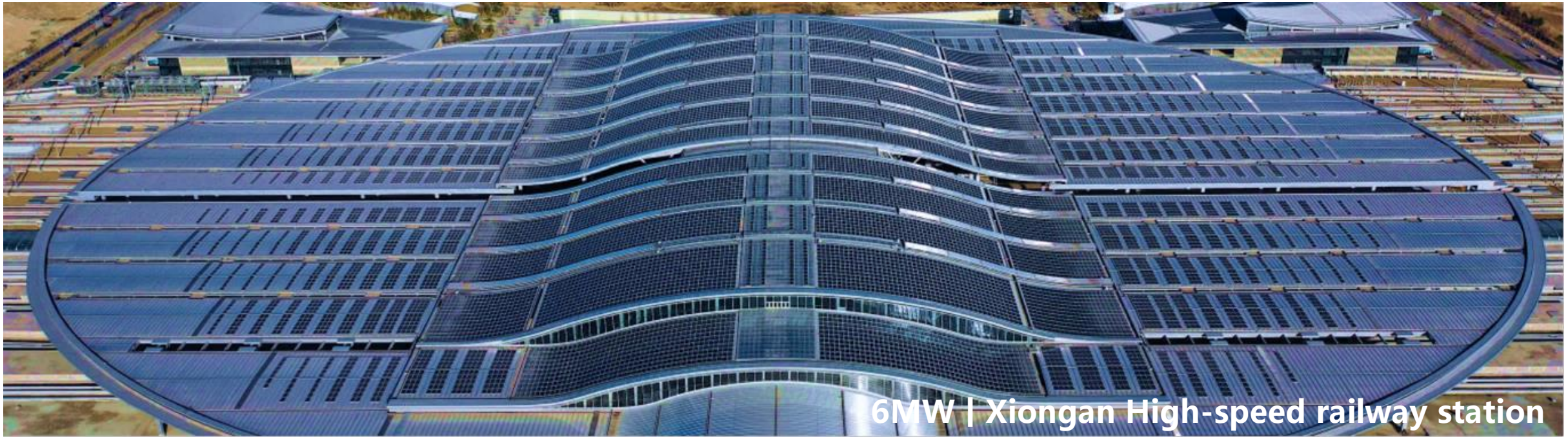
100MW | Wuhai

80MW | Qinghai

240MW | Zhangbei

60MW | Ningxia

PV Distributed and Integration Project



6MW | Xiongan High-speed railway station

6.68MW | Shanghai Hongqiao

1.5MW | Sierra Leone College

340kW | Selma Havana

964kW | Antwerp

PV Distributed and Integration Project


50MW | Great Wall Moto Rooftop


60MW | Guangxi Solar Agriculture


100MW | Xiangyin solar fishing


16kW | Maldives Island


450KW | Swiss Sun Park Project

YINGLI SOLAR
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For a Green World Together

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